letter, published in part as a footnote on page 126 in Ward's "Climates of the United States."

Considering particularly the Baltimore records, it is found that the average mean temperature for January, based upon the daily means for 53 years (1873–1925) is 34.3°. The average for the first decade is 34°; second decade, 34.5°; last decade, 34.5°. Taken by decades, the month would appear to average practically uniform in normal daily mean temperature, and, as a matter of fact, there are no very strong variations from day to day except for the period 21st-23d, inclusive.

The abrupt rise of 4° in this 53-year average, starting on the 20th and culminating on the 21st, and the persistence of mildness through the 22d, and, in a less marked degree, through the 23d, followed by a sharp drop of 2.5° on the 24th and almost uniformly normal conditions the last five days of January, form one of the most notable features of the temperature records of Baltimore. No other month shows anything like so pronounced a fluctuation from the long-period averages.

The three-day period, 21st–23d, averges 36.9°, which is 2.6° higher than the average for the month, 2.8° higher than for the three days preceding the 21st–23d, and 3.5° higher than for the succeeding three days.

If we take the two-day period, 21st–22d, it averages 37.4°, or 3.1° higher than the monthly normal, 3.3° higher than the preceding three days, and 4.0° higher than the succeeding three days.

This high average for the period, January 21–23, is not due to a few very warm days on these dates. These days were frequently mild, as shown by the following: The two days, 21st and 22d, taken together averaged above normal 35 times out of 55, or 64 per cent; the 21st alone averaged above normal 74 per cent, and the 22d alone, 69 per cent.

But while the average shows up this strongly for frequency of occurrence, there were strong variations in the frequency within the 55 years. Frequency was high during the first 8 years (1873 to 1880); very low from 1881 to 1893, with only two occurrences in the 13 years; very high from 1894 to 1917, with 19 occurrences in the 24 years; fairly frequent for the last decade, 1918 to 1927, with 6 occurrences in the 10 years.

Dividing the record of 55 years into halves, we find that at Baltimore the temperature averaged above normal for the period January 21–23, during the first half (1873–1899), 16 times, or 57 per cent; for the second half (1900–1927), 19 times, or 70 per cent.

No explanation of the cause of the abnormality has ever been offered, so far as the writer knows. It may be worth remarking that it comes just after the head of winter and seems to attend the initiation of lengthening days and the first pulsation toward spring. The mind holds to the belief that such irregularities are temporary and are smoothed out in the course of time; that records for some hundreds of years will give an annual temperature curve devoid of irregularities. As stated by Professor Marvin, "The human mind knows no reason why there should be an irregularity of this character; we are compelled to think of the normal temperature as a smooth progressive curve."

The immediate cause of each occurrence of the spell is readily seen from an examination of the weather maps. It is almost needless to say that they are caused by low-pressure areas moving eastward or northeastward, traversing the Lake Region and the St. Lawrence Valley, or the Ohio Valley and the North Atlantic States, and inducing southerly winds in the eastern States.

A file of weather maps for the years 1901 to 1927 was examined to discover the types of maps that produced the mild spells. In the 19 cases investigated it was found that LOWS (Alberta type) moving eastward over the Great Lakes and the St. Lawrence Valley produced 10 of the spells; LOWS coming from the far southwest and passing northeastward over the Ohio Valley or the Atlantic States caused 4; simultaneous movement of Alberta and southwestern (or Texas) LOWS caused 3; and LOWS that formed, or developed, over the Middle West or the Ohio Valley and moved northeastward caused the remaining 2.

NOTES AND ABSTRACTS

DISTRIBUTION OF BULLETINS OF THE MOUNT WEATHER OBSERVATORY

The Weather Bureau still possesses a number of the separate parts of Volumes I–VI of the above-named publication. Individuals, institutions and organizations lacking a complete file will be supplied with missing numbers so far as possible on application to Chief of Weather Bureau. Application for parts of any volume that may be desired will also be received and filled so far as the supply will permit.—*Editor.*

FURTHER NOTE ON "PROGRESS IN INTERNATIONAL METEOROLOGY"

Since the publication of the note under the above title in the November 1926 issue of this Review (p. 465), we have received the full text of the minutes of the eighth session of the International Committee on Intellectual Cooperation, held at Geneva in July, 1926. From this we reprint the whole of Annex 2, dealing with the—

QUESTION OF THE ESTABLISHMENT OF AN INTERNATIONAL BUREAU OF METEOROLOGY

Report by the Sub-Committee appointed at the Meeting of the International Committee on Intellectual Co-operation on July 29th, 1925, submitted to the Committee on July 26th, 1926.

At the Sixth Session of the International Committee on Intellectual Co-operation, held at Geneva from July 27th to July 29th, 1925, the Chairman communicated to the Committee a proposal submitted by M. van Everdingen, Director of the Netherlands Meteorological Observatory and Chairman of the International Meteorological Committee (I.M.C.), with regard to the creation of an International Bureau of Meteorology (I.B.M.) (Annex 4 to document C.445, M.165, 1925).

After a brief discussion, the Committee requested the undersigned to consider, together with M. van Everdingen and several other experts, how the Committee might assist in establishing this Bureau.

The present report sets out our conclusions:

M. van Everdingen's proposal was defined in a letter which General Delcambre, Director of the French Meteorological Service and Chairman of a special Committee set up by the International Meteorological Committee, addressed officially to the International Institute for Intellectual Co-operation on November 23rd, 1925.

The International Meteorological Committee is composed of the directors of the meteorological services of thirty countries (including Germany and Austria), who meet once every three years to

discuss scientific problems of international importance—a definition which covers almost every meteorological problem. The members of this Committee are not official representatives of their countries, and the Committee possesses no financial resources.

After a preliminary interview with M. van Everdingen, it was decided that the Sub-Committee should co-opt as experts the members of the special Committee appointed by the International Meteorological Committee. With a view to achieving a satisfactory result as soon as possible, a meeting of the Sub-Committee and the experts was held directly after the meeting of the experts to discuss a draft prepared by General Delcambre.

These two meetings took place on March 27th and March 29th, 1926, at Paris. At the first meeting, the technical side of the question was discussed and General Delcambre's draft was approved with certain alterations. Finally, the experts drew up a restricted programme, on the basis of which a start could be made, and prepared, in the order of their importance, the following list of the various desiderata to be attained:

(*a*) Administration of the archives of the national Meteorological Committees and a secretariat of the Committee to maintain relations with international organs interested in meteorology.

(*b*) Bibliography and retrospective international publications (maps of the Northern Hemisphere, experimental balloons, aeronautical climatology).

(*c*) Organisation of the ocean meteorological system; assistance in radio-meteorological centralisation and preservation of extracts from ships' logs.

The experts estimate that the minimum cost of carrying out points (*a*) and (*b*) of the restricted programme would be 100,000 to 150,000 gold francs.

These were the conclusions submitted at the meeting on March 29th, at which were present: M. Lorentz, Mme. Curie, M. Einstein, M. Luchaire; the experts Messrs. Delcambre, van Everdingen, Simpson, Carvalho, Brandao, J. Bjerknes, Werhlé; M. Roper, representing the International Commission for Air Navigation (I. C. A. N.), and M. de Vos van Steenwyck, whom the Committee of Experts had co-opted to maintain relations with the International Institute for Intellectual Co-operation. M. Lorentz presided over the meeting.

The Chairman proposed that they should not deal with the technical questions, which has been fully discussed at the former meeting. The experts, he pointed out, were unanimous in endorsing the utility of the proposed organisation, and it would not therefore be necessary to go into details. It would be sufficient for them to consider the relations to be established between the future Bureau and the League of Nations through the International Committee on Intellectual Co-operation. The moral support of this Committee might already be regarded as assured. The most urgent question was that of obtaining the material resources necessary for the creation and working of the International Bureau of Meteorology.

The discussion which followed this statement showed that the International Committee on Intellectual Co-operation might take action in two ways simultaneously:

1. The International Committee on Intellectural Co-operation might recommend the League of Nations to invite Governments to accord subsidies to the International Bureau of Meteorology.

2. The International Committee on Intellectual Co-operation might avail itself of the facilities it possessed in the form of the International Institute for Intellectual Co-operation and place at the disposal of the International Bureau of Meteorology provisionally a few rooms in which the Bureau could instal its secretariat and archives. The cost of installation would thus be diminished and the Bureau might begin work almost at once. It would be understood that, as soon as the International Bureau of Meteorology became firmly established and had proved its value, it would have to obtain its own premises and could no longer remain a charge on the Institute, which must be in a position to offer similar hospitality to any other scientific organisation created in similar circumstances. The Director of the Institute does not see any objection to such an arrangement.

There will be some difficulty, however, in the way of carrying out the first proposal. It would not only be desirable to establish the International Bureau of Meteorology, but the matter is, indeed, an urgent one. Several meteorological undertakings are about to be abandoned owing to lack of means, and this would create gaps which it would be impossible to fill later.

It therefore seems essential that the International Committee on Intellectual Co-operation should submit its conclusions to the next (September) Assembly of the League. Unfortunately, the Committee of Experts is not empowered to make any official proposal, as it is merely a Committee of Enquiry instructed by the International Meteorological Committee to submit a report to the Committee at its next meeting on September 20th.

The International Committee on Intellectual Co-operation will not be able to take a decision before its January session, and any action on the part of the League would be deferred for a whole year.

With a view to obviating such delay—which, in the opinion of the experts, would be highly undesirable—the undersigned have the honour to propose the following line of action:

The International Committee on Intellectual Co-operation might forthwith decide in *principle* to co-operate with the International Meteorological Committee for the creation of an International Bureau of Meteorology in accordance with the suggestions set out above. It might authorise the present Sub-Committee to act on its behalf as soon as the International Meteorological Committee has formally approved the scheme drawn up by the experts, so that the recommendations in question may be submitted to the Council of the League at its December session.

As regards the question of premises, a decision might be taken by the Committee of Directors of the Institute.

The representative of the International Commission for Air Navigation has promised to see that, at the next (October) meeting of the Committee, that organisation takes action on the same lines to secure the creation of the International Bureau of Meteorology.

(*Signed*) M. CURIE. (*Signed*) H. A. LORENTZ.
(*Signed*) A. EINSTEIN.

APIA WEATHER DURING 1926[1]

The following summary for Apia, Samoa, for the year 1926 contains two items of more than ordinary interest, first the occurrence of drought after the great daily rainfall of January 1, 1926:

The total rainfall for the year 1926 at Mulinu'u was 103.54 inches which is 3.31 inches less than the average rainfall for the years 1890–1923. The heavy rains, amounting to 7.02 inches, accompanying the cyclone of January 1, 1926, were followed by eight weeks of comparative drought, broken finally by rains occurring in the first week of March. On March 27 and 28, during the near approach of the cyclone, which later caused serious damage at Palmerston Island and Rarotonga, there was a rainfall of 4.7 inches. April and May were unusually dry, so that at the end of the first five months of the year the rainfall was 18 inches less than the normal. During the summer and continuing until October the rainfall for each month was very close to the average. During November and December the rainfall has been unusually abundant so that the year closed with almost the normal rainfall.

The average temperature for 1926 was 79.76° F., the highest recorded temperature 90.5° F. occurring on January 11 and the lowest 66.2°F. on October 10. The temperature of Samoa has steadily increased during the past 35 years, during which time continuous records have been taken. The winter months—June, July, and August—are now as hot as were the summer months in 1890. For the whole year, the temperature was 2.22° above the average prevailing temperature of 1890.

An analysis of 1,066 cases of deficient rainfall in the United States led me in 1906, to make the following comment:

The one fact which stands out most prominently is that droughty periods are preceded in the majority of cases by a single heavy rain or by several days of light to moderate rains. This appears to be true for both the semiarid regions of the west and the more humid regions of the East and South.

It seems to be a rule of nature that the causes which lead up to a culmination in the march of any meteorological element almost invariably operate to make it difficult for a similar event soon to repeat itself. This is but another way of saying that one extreme is apt to be followed by another in the opposite direction.

In the case of precipitation, as illustrated by the drought in Samoa following the heavy cyclonic rains of January 1, 1926, it may well be that the physical reasons back of the drought are as follows.

Water vapor spreads into the higher atmospheric levels mainly by vertical and horizontal convection. Local vertical convection, as in the thunderstorms of summer,

[1] Samoa Times, Jan. 7, 1927.